



SEQUENCE LISTING

<110> KUMAGAI, Monto H.  
DELLA-CIOPPA, Guy R.  
ERWIN, Robert L.  
McGEE, David R.

<120> METHOD OF DETERMINING THE PRESENCE OF A  
TRAIT IN A PLANT BY TRANSFECTING A NUCLEIC ACID SEQUENCE OF  
A NON-PLANT DONOR INTO A HOST PLANT IN A POSITIVE  
ORIENTATION

<130> 008010137US07

<140> 09/359,300

<141> 1999-07-21

<160> 60

<170> FastSEQ for Windows Version 3.0

<210> 1

<211> 26

<212> DNA

<213> Tomato mosaic virus

<400> 1

ctcgcaaagt ttgaaccaa atcctc

26

<210> 2

<211> 35

<212> DNA

<213> Tomato mosaic virus

<400> 2

cggggtacct gggccccaac cggggggttc ggggg

35

<210> 3

<211> 41

<212> DNA

<213> Tomato mosaic virus

<400> 3

tectcgagcc taggetcgca aagtttcgaa ccaaatactc a

41

<210> 4

<211> 35

<212> DNA

<213> Tomato mosaic virus

<400> 4

cggggtacct gggccccaac cggggggttc ggggg

35

<210> 5

<211> 24

<212> DNA

<213> Tomato mosaic virus  
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 tatgtatggg gcagaagaac agat 24  
 <210> 6  
 <211> 24  
 <212> DNA  
 <213> Tomato mosaic virus  
 <400> 6  
 agtcgaactct tctctctctg gcac 24  
 <210> 7  
 <211> 30  
 <212> DNA  
 <213> Tomato mosaic virus  
 <400> 7  
 tgctcgagtg tgttcttcag tttctgtca 30  
 <210> 8  
 <211> 30  
 <212> DNA  
 <213> Tomato mosaic virus  
 <400> 8  
 aactcgagcg ctctgatttc tccgaagctt 30  
 <210> 9  
 <211> 114  
 <212> DNA  
 <213> Tomato mosaic virus  
 <220>  
 <221> CDS  
 <222> (28)...(115)  
 <400> 9  
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 Met Ser Val Ala Leu Leu Trp Val Val  
 1 5  
 tct cct tgt gac gtc tca aat ggg aca agt ttc atg gaa tca gtc cgg 102  
 Ser Pro Cys Asp Val Ser Asn Gly Thr Ser Phe Met Glu Ser Val Arg  
 10 15 20 25  
 gag gga aac cgt 114  
 Glu Gly Asn Arg  
 <210> 10  
 <211> 29  
 <212> PEST  
 <213> Tomato mosaic virus

<400> 10  
Met Ser Val Ala Leu Leu Trp Val Val Ser Pro Cys Asp Val Ser Asn  
1 5 10 15  
Gly Thr Ser Phe Met Glu Ser Val Arg Glu Gly Asn Arg  
20 25

<210> 11  
<211> 39  
<212> DNA  
<213> Nicotiana benthamiana

<400> 11  
gcctcgagtg cagcatggaa acccttctaa agcttttcc 39

<210> 12  
<211> 36  
<212> DNA  
<213> Nicotiana benthamiana

<400> 12  
tccctaggtc aaaggctctc tattgctaga ttgcc 36

<210> 13  
<211> 111  
<212> DNA  
<213> Tobacco mosaic virus

<220>  
<221> CDS  
<222> (25)...(111)

<400> 13  
gttttaaata cgctcgagtg cagc atg gaa acc ctt cta aag cct ttt cca 51  
Met Glu Thr Leu Leu Lys Pro Phe Pro  
1 5

tct cct tta ctt tcc att cct act cct aac atg tat agt ttc aaa cac 99  
Ser Pro Leu Leu Ser Ile Pro Thr Pro Asn Met Tyr Ser Phe Lys His  
10 15 20 25

aac ttc act ttt 111  
Asn Phe Thr Phe

<210> 14  
<211> 29  
<212> PRT  
<213> Tobacco mosaic virus

<400> 14  
Met Glu Thr Leu Leu Lys Pro Phe Pro Ser Pro Leu Leu Ser Ile Pro  
1 5 10 15  
Thr Pro Asn Met Tyr Ser Phe Lys His Asn Phe Thr Phe  
20 25

<210> 15

<211> 44  
 <212> DNA  
 <213> Erwinia herbicola  
  
 <400> 15  
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 <210> 16  
 <211> 43  
 <212> DNA  
 <213> Erwinia herbicola  
  
 <400> 16  
 aagatctctc gagctaaacg ggacgctgcc aaagaccggc cgc 43  
  
 <210> 17  
 <211> 23  
 <212> DNA  
 <213> Tobacco mild green mosaic virus  
  
 <400> 17  
 tgtgaaactc gaaaaggctc cgg 23  
  
 <210> 18  
 <211> 36  
 <212> DNA  
 <213> Tobacco mild green mosaic virus  
  
 <400> 18  
 cggggtagctt gggccgctac cggcgggttag gggagg 36  
  
 <210> 19  
 <211> 31  
 <212> DNA  
 <213> Ribgrass mosaic virus  
  
 <400> 19  
 tactcgaggt tcataagacc gcggtaggcg g 31  
  
 <210> 20  
 <211> 36  
 <212> DNA  
 <213> Ribgrass mosaic virus  
  
 <400> 20  
 cggggtagctt gggccctac ccgggggttta gggagg 36  
  
 <210> 21  
 <211> 107  
 <212> DNA  
 <213> N. tabacum  
  
 <220>  
 <221> CDS  
 <222> 21.....107  
  
 <400> 21

gttttaata cgctcgagcc atg gct tcc tca gtt ctt tcc tct gca gca gtt 53  
Met Ala Ser Ser Val Leu Ser Ser Ala Ala Val  
1 5 10

gcc acc cgc agc aat gtt gct caa gct aac atg gtt gca cct ttc act 101  
Ala Thr Arg Ser Asn Val Ala Gln Ala Asn Met Val Ala Pro Phe Thr  
15 20 25

ggc ctt 107  
Gly Leu

<210> 22  
<211> 29  
<212> PRT  
<213> N. tabacum

<400> 22  
Met Ala Ser Ser Val Leu Ser Ser Ala Ala Val Ala Thr Arg Ser Asn  
1 5 10 15  
Val Ala Gln Ala Asn Met Val Ala Pro Phe Thr Gly Leu  
20 25

<210> 23  
<211> 1543  
<212> DNA  
<213> Tobacco mild green mosaic virus

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ttgtcagata aaagggttggt taaagatttg ttttttggtt gactgagtcg ataattgtctt 120  
acgagccctaa agttagtga ctccttgctc ttacgaaaaa ggaggaaaatt ttacccaagg 180  
ctttgacgag attaaagact gtctctatta gtactaagga tgttatatct gttaaggagt 240  
ctgagtcctt gtgtgatatt gatttggttag tgaatgtgcc attagataag tataggtagt 300  
tgggtgtttt ggggtgttgtt ttacccgggtg aatgggtggt accggatttc gttaaagggtg 360  
gggtaacagt gaggctgatt gacaaaacggc ttgaaaattc cagagagtgc ataattggta 420  
cgtaccgagc tggctgtaaag gacagaaggt tccagttcaa gctggttcca aattacttcg 480  
taccattgga ggatgccaa cgaaaacccg ggcaggttca tgtgggaatt caaaattctga 540  
agatcgaagc tggatggcaa cctctagctc tagaggtggt tctgttgcc atggttacta 600  
ataacgttgt tgttaaagggt ttgagggaaa aggtcatcgc agtgaatgat ccgaacgtcg 660  
aagggtttga aggtgtggtt gacgatttcg tcgatttcgt tggctgcattc aaggcgattg 720  
acagttttcg aaagaaaaag aaaaagattg gaggaaggga tgtaaaatat aataagtata 780  
gatatagacc ggagagatac gcgggtcctg attcgttaca atataaagaa gaaaatgggtt 840  
tacaacatca cgagctcgaa tcagtaccag tatttcgcag cgatgtgggc agagccaca 900  
gcatgtgctt accagtgggt gtctgcgttg tcgcaatcgt atcaaaactca ggccggcaaga 960  
gatactgtta gacagtagtt ctctaaccct ctgagtgcga ttgtgacacc gaaccaggg 1020  
tttcagaaaa caggataccg ggtgtatatt aattcagcag ttctaaaaac gttgtaacag 1080  
tctctcagta agtctcttga tactagaaat aggtcattg aaactgaaga agagtccgtt 1140  
ccatcggttt ccgaagtatc taatgcaaca caactgttg atgatgcgac cgtggccatc 1200  
aggagtcaaa tttagctttt gctgaacgag ctctcaaacg gacatggtct gatgaacagg 1260  
gcagagtctg aggttttatt accttggggt actgpgccag ctacataggc gtgggtgcaca 1320  
cgatagtga cagtgttttt ctctccactt aaatcgaaga gatatactta cgggtgaatt 1380  
ccgcaagggt gggttaaaac aaattacgca atgttttagg ttccatttaa atcgaaacct 1440  
gttatttctt ggatcacctg ttaagctacg cgtggggtat attacagtgg gaataactaa 1500  
aagttagagg ttgaattct cctaaacccc gggtaggggc cca 1563

<210> 24  
 <211> 55  
 <212> DNA  
 <213> rape mosaic virus

<400> 24  
 gatggggcct taatacgact cactatagtt ttatTTTTgt tgcaacaaca acaac 55

<210> 25  
 <211> 30  
 <212> DNA  
 <213> rape mosaic virus

<400> 25  
 attgtggcct tcatgacgag ctatatcacg 30

<210> 26  
 <211> 497  
 <212> DNA  
 <213> rape mosaic virus

<400> 26  
 ccttaataag actcactata gttttatTTT tgTTgcaaca acaacaacaa attacaataa 60  
 caacaaaaca aatacaaaaca acaacaacat ggcacaattt caacaaaacag taaacatgca 120  
 aacattgcag gctgcgcgag ggogcaacag cctgggtgaat gatttagcct cacgacgtgt 180  
 ttatgacaat gctgtcgagg agctaaatgc acgctcgaga cgcctaagg ttcattactc 240  
 caaatcagtg tctacggaac atgacgctgt tagcttcaaa cgcttatccg gagtttgaga 300  
 ttccctttac tcatacccaa catgcgcgtac actcccttgc gggTggccta aggactcttg 360  
 agttagagta tctcatgatg caagtTccgt tgggttctct gacgtacgac atcggtggta 420  
 actttgcagc gcaccttttc aaaggacgcg actacgttca ctgctgtatg ccaaactTgg 480  
 atgtacgtga tatagct 497

<210> 27  
 <211> 59  
 <212> DNA  
 <213> rape mosaic virus

<400> 27  
 gatggggcct taatacgact cactatagtt ttatTTTTgt tgcaacaaca acaac 55

<210> 28  
 <211> 37  
 <212> DNA  
 <213> rape mosaic virus

<400> 28  
 atcgtttaaa ctggggcctt acccggggtt agggagg 37

<210> 29  
 <211> 497  
 <212> DNA  
 <213> rape mosaic virus

<400> 29  
 ccttaataag actcactata gttttatTTT tgTTgcaaca acaacaacaa attacaataa 60  
 caacaaaaca aatacaaaaca acaacaacat ggcacaattt caacaaaacag taaacatgca 120  
 aacattgcag gctgcgcgag ggogcaacag cctgggtgaat gatttagcct cacgacgtgt 180

ttatgacaat gctgtcgagg agctaaatgc acgctcgaga cgccttaagg ttcattactc	240
caaatcagtg tctacggaac agacgctggt agcttcaaac gcttatccgg agtttgagat	300
ttcctttact cctacccaaa catgcggtac actcccttgc ggggtggccta aggactcttg	360
agttagagta tctcatgatg caagtctcgt tcgggtctct gacgtacgac atcgggtggta	420
actttgagc gaccttttcc aaaggacgcg actacgttca ctgctgtatg ccaaaccttg	480
atgtacgtga tatagct	497

<210> 30  
 <211> 55  
 <212> DNA  
 <213> rape mosaic virus

<400> 30 gatggcgct taatacgact cactatagtt ttatttttgt tgcaacaaca acaac	55
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<210> 31  
 <211> 37  
 <212> DNA  
 <213> rape mosaic virus

<400> 31 atogtttaaa ctgggcccct acccggggtt agggagg	37
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<210> 32  
 <211> 25  
 <212> DNA  
 <213> Pichia pastoris

<400> 32 ctgactctg ttggctcatg acgat	25
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<210> 33  
 <211> 26  
 <212> DNA  
 <213> Pichia pastoris

<400> 33 caagcttgca caaacgaacg tctcac	26
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<210> 34  
 <211> 42  
 <212> DNA  
 <213> Pichia pastoris

<400> 34 cactcgagag catggctatt cccgaagaat ttgatattat cg	42
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<210> 35  
 <211> 36  
 <212> DNA  
 <213> Pichia pastoris

<400> 35 tccctaggtt agaattctagc aagaccggtc ttctcg	36
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<210> 36  
 <211> 14

400 36  
tcgagcgggcc gcat 14

gactcgactg caccatgata agattcttag tctctctctt gc 42

tccttaggct aaatagcata acttccacat caaagg 36

4400: 39  
gttttaaata cgcctcagagg atg atc aga ttc tta gtc ctc tct ttg cta att 52  
Met Ile Arg Phe Leu Val Leu Ser Leu Leu Ile  
1 5 10

ctc acc ctc ttc cta aca act cct gct gtg gag ggc gat gtt agc ttc 100  
Leu Thr Leu Phe Leu Thr Thr Pro Ala Val Glu Gly Asp Val Ser Phe  
15 20 25

tgt tta tca 109  
 Arg Leu Ser  
 30

Met Ile Arg Phe Leu Val Leu Ser Leu Leu Ile Leu Thr Leu Phe Leu  
1 5 10 15  
Thr Thr Pro Ala Val Glu Gly Asp Val Ser Phe Arg Leu Ser  
20 25 30

8 16



<211> 19  
 <212> PRT  
 <213> P ycelii

<400> 41  
 Ser Tyr Val Pro Ser Ala Glu Gln Ile Leu Glu Phe Val Lys Gln Ile  
 1 5 10 15  
 Ser Ser Gln

<210> 42  
 <211> 839  
 <212> DNA  
 <213> Nicotiana benthamiana

<220>  
 <221> CDS  
 <222> (15)...(677)

<400> 42  
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 1 5 10  
 agc ttc aag ctc gtt atc gtt ggc gat gga ggc aca ggg aag acc aca 98  
 Ser Phe Lys Leu Val Ile Val Gly Asp Gly Gly Thr Gly Lys Thr Thr  
 15 20 35  
 ttt gta aag aga cat ctt act gga gag ttt gag aag aag tat gaa ccc 146  
 Phe Val Lys Arg His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro  
 30 35 40  
 act att ggt gtt gag gtt cat cct ctt gat ttc ttc act aac tgt ggc 194  
 Thr Ile Gly Val Glu Val His Pro Leu Asp Phe Phe Thr Asn Cys Gly  
 45 50 55 60  
 aag atc cgt ttc tac tgt tgg gat act gct ggc caa gag aaa ttt ggt 242  
 Lys Ile Arg Phe Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly  
 65 70 75  
 ggt ctt agg gat ggt tac tac atc cat gga caa tgt ggt atc atc atg 290  
 Gly Leu Arg Asp Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met  
 80 85 90  
 ttt gat gtc aca gca cga ctg aca tac aag aat gtt cca aca tgg cat 338  
 Phe Asp Val Thr Ala Arg Leu Thr Tyr Lys Asn Val Pro Thr Trp His  
 95 100 105  
 cgt gat ctt tgc agg gtt tgt gaa aac atc cca att gtt ctt tgt ggg 386  
 Arg Asp Leu Cys Arg Val Cys Glu Asn Ile Pro Ile Val Leu Cys Gly  
 110 115 120  
 aat aaa gtt gat gtg aag aac agg caa gtc aag gcc aag cag gta aca 434  
 Asn Lys Val Asp Val Lys Asn Arg Gln Val Lys Ala Lys Gln Val Thr  
 125 130 135 140  
 ttc cac agg aag aag aac ctc cag tat tac gag ata tct gcc aag agc 482

Phe His Arg Lys Lys Asn Leu Gln Tyr Tyr Glu Ile Ser Ala Lys Ser  
 145 150 155  
 aac tac aac ttc gag aag cca ttc ttg tac ctt gct aga aag ctc gct 530  
 Asn Tyr Asn Phe Glu Lys Pro Phe Leu Tyr Leu Ala Arg Lys Leu Ala  
 160 165 170  
 ggg gac gct aat ctt cac ttt gtg gaa tca cct gcc ctt gct ccc ccg 578  
 Gly Asp Ala Asn Leu His Phe Val Glu Ser Pro Ala Leu Ala Pro Pro  
 175 180 185  
 gaa gtt caa atc gac ttg gct gct cag cag cag cat gag ggg gag ctt 626  
 Glu Val Gln Ile Asp Leu Ala Ala Gln Gln Gln His Glu Ala Glu Leu  
 190 195 200  
 gca gca gca gca agt cag cca ctt cct gat gac gat gat gac acc ttc 674  
 Ala Ala Ala Ala Ser Gln Pro Leu Pro Asp Asp Asp Asp Thr Phe  
 205 210 215 220  
 gag tagagaaaga gagatgtgat ctgtcactga ttaccgcta gggcttgtct 727  
 Glu  
 gaactttttt ttgttcattg tgcatttttt atgtgtcagt actttgaaat gaatcgatga 787  
 cattagtaat ttccattttt aagtttttaa ctgtcgctat gaaagtgaaa ac 839

<210> 43  
 <211> 221  
 <212> PPT  
 <213> Nicotiana benthamiana

<400> 43  
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 20 25 30  
 His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro Thr Ile Gly Val  
 35 40 45  
 Glu Val His Pro Leu Asp Phe Thr Asn Cys Gly Lys Ile Arg Phe  
 50 55 60  
 Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly Gly Leu Arg Asp  
 65 70 75 80  
 Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met Phe Asp Val Thr  
 85 90 95  
 Ala Arg Leu Thr Tyr Lys Asn Val Pro Thr Trp His Arg Asp Leu Cys  
 100 105 110  
 Arg Val Cys Glu Asn Ile Pro Ile Val Leu Cys Gly Asn Lys Val Asp  
 115 120 125  
 Val Lys Asn Arg Gln Val Lys Ala Lys Gln Val Thr Phe His Arg Lys  
 130 135 140  
 Lys Asn Leu Gln Tyr Tyr Glu Ile Ser Ala Lys Ser Asn Tyr Asn Phe  
 145 150 155 160  
 Glu Lys Pro Phe Leu Tyr Leu Ala Arg Lys Leu Ala Gly Asp Ala Asn  
 165 170 175  
 Leu His Phe Val Glu Ser Pro Ala Leu Ala Pro Pro Glu Val Gln Ile  
 180 185 190  
 Asp Leu Ala Ala Gln Gln Gln His Glu Ala Glu Leu Ala Ala Ala

195 200 205  
 Ser 3ln Pro Leu Pro Asp Asp Asp Asp Asp Thr Phe Glu  
 210 215 220

<210> 44  
 <211> 738  
 <212> DNA  
 <213> Nicotiana benthamiana

<400> 44  
 cttaactttt ggcgatggct ctacctaacc agcaaacgcgt ggattaacct agcttcaagg 60  
 tegtatatgt tggcgatgga ggcacaggga agaccacatt tgtaaagaga catcttactg 120  
 gagagtttga gaagaagtat gaaccacta ttgggtgtga ggttcactct cttgattttt 180  
 tcaataactg tggcaagatc cgtttctact gttggatact gctgggcaag agaaatttgg 240  
 tgggtttagg gatggttact acatccatgg acaatgtgct atcatcatgt ttgatgtcac 300  
 agcagcactg acatacaaga atgttccaac atggcacogt gatctttgca ggggtttctg 360  
 aaaacatccc aattgtttct tgtgggaata aagtgtatgt gaagaacagg caagtcaagg 420  
 ccaagcaggt aacattccac aggaagaaga acctccagta ttacgagata totgccaaga 480  
 gcaactacaa cttcgagaag ccattcttgt accttgctag aaagctcgcc ggggacgcta 540  
 atcttaactt tgtggaatca cctgccttg ctccccgga agttcaaatc gacttgggtg 600  
 ctacgagca gcatgaggcg gagcttgcag cagcagcaag tcagccactt cctgatgacg 660  
 atgatgacac cttcgagtag agaaagagag atgtgatctg tcactgatta ccggttaggg 720  
 cttgtctgaa cttttttt 738

<210> 45  
 <211> 679  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 45  
 cttaactttt ggcgatggct ctacctaacc agcaaacgcgt ggattaacct agcttcaagg 60  
 tegtatatgt tggcgatgga ggcacaggga agaccacatt tgtaaagaga catcttactg 120  
 gagagtttga gaagaagtat gaaccacta ttgggtgtga ggttcactct cttgattttt 180  
 tcaataactg tggcaagatc cgtttctact gttgggatac tgcctgggcaag gagaaatttg 240  
 gtgggttttag ggatggttac tacatccatg gacaatgtgc tatcatcatg ttgatgtcac 300  
 cagcagcact gacatacagg aatgttccaa catggcacog tcatcttttg aggggttctg 360  
 ccaagcaggt aacattccac aggaaggagg aactccagta ttacgagata totgccaaga 420  
 gcaactacaa cttcgagaag ccattcttgt accttgctag aaagctcgcc ggggacgcta 480  
 atcttaactt tgtggaatca cctgccttg ctccccgga agttcaaatc gacttgggtg 540  
 ctacgagca gcatgaggcg gagcttgcag cagcagcaag tcagccactt cctgatgacg 600  
 atgatgacac cttcgagtag agaaagagag atgtgatctg tcactgatta ccggttaggg 660  
 cttgtctgaa cttttttt 679

<210> 46  
 <211> 667  
 <212> DNA  
 <213> N. tabacum

<400> 46  
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 gatggaggga cagggaagac cacatttgtt aagagacatc ttactggaga gtttgagaag 120  
 aagtatgaac ccactatttg ttttgaggtt catctctttg attctttcac taactgtggc 180  
 aagatccgtt tctactgttg ggatactgct ggccaagaga aatttgggtg tottagggat 240  
 ggtaactaca tccatggaca atgtgctatc atcatgtttg atgtccacgc acgactgaca 300  
 tacaagaatg ttccaacatg gacccgtgat ctttgcaggg ttctgtgaaa catcccaatt 360  
 gttcttttgt ggaataaagt tgatgtgaag aacaggcaag tcaaggccaa gcaggtaaca 420  
 ttccacagga agaagaacct ccagtattac gagatatctg ccaagagcaa ctacaacttc 480

gagaagccat	tcttgtacct	tgctagaaaag	ctcgccgggg	acgctaactct	tcactttgtg	540
gaatcacctg	cccttgctcc	cccggaagtt	caaatcgact	tgggtgctca	gcagcagcat	600
gaggcggagc	ttgcagcagc	agcaagtcag	ccacttcctg	atgaacgatga	tgacaccttc	660
gagtaga						667

<210> 47  
 <211> 667  
 <212> DNA  
 <213> N. tabacum

atggctctac	caaaccaaca	aactgtagat	tatccaagct	tcaagcttgt	aatcgtgggc	60
gatggaggaa	ctgggaaaac	aacttttgtc	aagaggcacc	tcactgggtga	atttgagaag	120
aaatatgaac	ccactattgg	tgtggaggtt	catccattag	acttcctcac	aaattgtggg	180
aaaattcgtc	tttattggtg	ggatactgct	ggacaagaga	agtttgaggg	tcttcgggat	240
ggttactaca	ttcatgggca	atgcgcaatt	atcatgtttg	atgttacagc	ccgtctgacc	300
tacaagaatg	ttctctacgt	gcctcgagat	ctctgcaggg	tttctgaaaa	catccctatt	360
gtctcttctg	gaaacaaaag	tgatgtcaag	aacaggcagg	tttaaggcaaa	gcaagttacc	420
ttccacagga	agaaaaatct	gcaatactat	gagatctcag	caaagagtaa	ctacaacttt	480
gagaagcctt	ttctgtacct	tgcagaaaag	cttgctgggg	atgctaactct	tcactttgtg	540
gaatcacctg	cacttgctcc	ccctgaagta	caaattgatt	tagctgcaca	gcaactgcat	600
gaacaagagc	ttttgcaagc	cgtctggcac	gcacttcacg	atgaacgatga	tgaagctttt	660
gaataga						667

<210> 48  
 <211> 137  
 <212> PFT  
 <213> Tobacco mosaic virus

<400> 48															
Met	Ala	Leu	Pro	Asn	Gln	Gln	Thr	Val	Asp	Tyr	Pro	Ser	Phe	Lys	Leu
1				5					10					15	
Val	Ile	Val	Gly	Asp	Gly	Gly	Thr	Gly	Lys	Thr	Thr	Phe	Val	Lys	Arg
		20						25					30		
His	Leu	Thr	Gly	Glu	Phe	Glu	Lys	Lys	Tyr	Glu	Pro	Thr	Ile	Gly	Val
		35					40					45			
Glu	Val	His	Pro	Leu	Asp	Phe	Phe	Thr	Asn	Cys	Gly	Lys	Ile	Arg	Phe
		50				55					60				
Tyr	Cys	Trp	Asp	Thr	Ala	Gly	Gln	Glu	Lys	Phe	Gly	Gly	Leu	Arg	Asp
65					70					75				80	
Gly	Tyr	Tyr	Ile	His	Gly	Gln	Cys	Ala	Ile	Ile	Met	Phe	Asp	Val	Thr
			35					90						95	
Ala	Arg	Leu	Thr	Tyr	Lys	Asn	Val	Pro	Thr	Trp	His	Arg	Asp	Leu	Cys
		100						105					110		
Arg	Val	Cys	Glu	Asn	Ile	Pro	Ile	Val	Leu	Cys	Gly	Asn	Lys	Val	Asp
		115					120					125			
Val	Lys	Asn	Arg	Gln	Val	Lys	Ala	Lys							
		130					135								

<210> 49  
 <211> 135  
 <212> PFT  
 <213> Tobacco Mosaic Virus

<400> 49															
Met	Ala	Leu	Pro	Asn	Gln	Gln	Thr	Val	Asp	Tyr	Pro	Ser	Phe	Lys	Leu
1				5					10					15	

Val	Ile	Val	Gly	Asp	Gly	Gly	Thr	Gly	Lys	Thr	Thr	Phe	Val	Lys	Arg
		20						25					30		
His	Leu	Thr	Gly	Glu	Phe	Glu	Lys	Lys	Tyr	Glu	Pro	Thr	Ile	Gly	Val
		35					40					45			
Glu	Val	His	Pro	Leu	Asp	Phe	Phe	Thr	Asn	Cys	Gly	Lys	Ile	Arg	Phe
	50					55					60				
Tyr	Cys	Trp	Asp	Thr	Ala	Gly	Gln	Glu	Lys	Phe	Gly	Gly	Leu	Arg	Asp
65					70					75				80	
Gly	Tyr	Tyr	Ile	His	Gly	Gln	Cys	Ala	Ile	Ile	Met	Phe	Asp	Val	Thr
			85						90					95	
Ser	Thr	Thr	Asp	Ile	Gln	Glu	Cys	Ser	Asn	Met	Ala	Pro	Ser	Leu	Gln
			100					105					110		
Gly	Leu	Lys	His	Ser	Gln	Leu	Phe	Val	Gly	Ile	Lys	Leu	Met	Lys	
		115					120					125			
Asn	Arg	Gln	Val	Lys	Ala	Gln									
	130					135									

<210> 50  
 <211> 277  
 <212> DNA  
 <213> Tobacco mosaic virus

<220>  
 <221> CDS  
 <222> (1)...(277)

<400> 50																
gct	act	atg	gtt	gcc	tct	cgg	gct	cag	gcc	act	atg	gtc	gct	cct	ttc	48
Ala	Thr	Met	Val	Ala	Ser	Pro	Ala	Gln	Ala	Thr	Met	Val	Ala	Pro	Phe	
1			5					10					15			
aac gga ctt aag tcc tcc gct cct tcc cag cca ccc gca agg cta aca															96	
Asn	Gly	Leu	Lys	Ser	Ser	Ala	Pro	Ser	Gln	Pro	Pro	Ala	Arg	Leu	Thr	
			20					25					30			
acg aca tta ctt cca tca caa gca acg gcg gaa gag tta act gca tgc															144	
Thr	Thr	Leu	Leu	Pro	Ser	Gln	Ala	Thr	Ala	Glu	Glu	Leu	Thr	Ala	Cys	
			35					40					45			
agg tgt ggc ctc cga ttg gaa aga aga agt ttg aga ctc tct ctt acc															192	
Arg	Cys	Gly	Leu	Arg	Leu	Glu	Arg	Arg	Ser	Leu	Arg	Leu	Ser	Leu	Thr	
			50				55					60				
ttc ctg acc tta cgg att cgg aat tgg cta agg aag ttg act acc tta															240	
Phe	Leu	Thr	Leu	Pro	Ile	Pro	Asn	Trp	Leu	Arg	Lys	Leu	Thr	Thr	Leu	
			65			70				75					80	
tcc gca aca agt gga ttc ctt gtg ttg aat tcg aag t															277	
Ser	Ala	Thr	Ser	Gly	Phe	Leu	Val	Leu	Asn	Ser	Lys					
					85					90						

<210> 51  
 <211> 92  
 <212> PRT  
 <213> Tobacco mosaic virus

<400> 51  
 Ala Thr Met Val Ala Ser Pro Ala Gln Ala Thr Met Val Ala Pro Phe  
 1 5 10 15  
 Asn Gly Leu Lys Ser Ser Ala Pro Ser Gln Pro Pro Ala Arg Leu Thr  
 20 25 30  
 Thr Thr Leu Leu Pro Ser Gln Ala Thr Ala Glu Glu Leu Thr Ala Cys  
 35 40 45  
 Arg Cys Gly Leu Arg Leu Glu Arg Arg Ser Leu Arg Leu Ser Leu Thr  
 50 55 60  
 Phe Leu Thr Leu Pro Ile Pro Asn Trp Leu Arg Lys Leu Thr Thr Leu  
 65 70 75 80  
 Ser Ala Thr Ser Gly Phe Leu Val Leu Asn Ser Lys  
 85 90

<210> 51  
 <211> 167  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 52  
 acttgatctg tticatatcta aaaccaaaac tcatgtttgt tcaactccaaa cacaaacaca 60  
 gcagtaatca aagatcgtct tataacaaaa ggaaatgcaa caaaacagaa gaaacaacta 120  
 agtagtaggc aagattcttc ttcactcgtc ttcttggtta cggagcc 167

<210> 51  
 <211> 393  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 53  
 gaaaagagct cggctagtta ttgggcatgg cctgaccagc agcaacaaca tcacaatcat 60  
 catcagttca attgatcata ttgtctaaga acaacatcat actcatcttg atatcattat 120  
 ttatcatcaa aagaaaaatt cgtagatttt ttttaataagt attttcaa atttttggcac 180  
 gtttaaaatt aattaaattg ggttattatg tttacttgat ctgtttcata ctaaaaccaa 240  
 aaggaaaaac aaaactcatg ttgttcact ccaaacacaa acacagpagt aatcaaaaat 300  
 cgtcttataa caaaaaggaa atgcaacaaa acagaagaaa caactaagta gtaggcaaga 360  
 ctctctctca ctgtctctct tggctacgga gcc 393

<210> 54  
 <211> 24  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 54  
 Glu Thr Thr Ser Ala Ser Tyr Trp Ala Trp Pro Asp Gln Gln Gln Gln  
 1 5 10 15  
 His His Asn His His Gln Phe Asn  
 20

<210> 55  
 <211> 418  
 <212> DNA  
 <213> Homo sapiens

<400> 55  
 gaagcggctc gctgcattag tgatgaagtg cgggaagggc aaagtctggc tccatcccaa 60  
 cgaaagctcc gacatctcca tggccaattc ccgccaaaac atcaggaagc ttgtgaagga 120

tggtttcatt	atcaggaagc	caaccaagat	tcactctcgt	tcagagctc	gcaaaatgaa	180
gattgccaag	atgaagggtc	gtcactctgg	atacggtaag	aggaagggtc	cccgtagaagc	240
taggttgcca	acaaagggtc	tgtggatgcg	taggatgcgt	gttcttaggc	gtctgttgaa	300
gaaatacaga	gagaacgaaga	agattgacaa	gcacatgtac	catgacatgt	acatgcgtgt	360
taagggtaat	gtgttcaaga	acaagcgtgt	cttgatggag	agtatccaca	agtc aaaggc	420
ctagaagcta	ggggagaa					438

<210> 56  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

gaagaggctc	gcctctagtg	tcctccgctg	tggaagaag	aaggctctgt	tagaccccaa	60
tgagaccaat	gaaatcgcca	atgccaactc	ccgtcaggag	atccggaagc	tcataaaaga	120
tggtctgatt	atccgcaagc	ctgtgacggc	ccattcccg	gtctgatgac	ggaaaaaac	180
cttggcccg	cggaagggtc	ggcaccatgg	cataggttaag	cggaagggtc	cagccaatgc	240
ccgaatgcca	gagaagggtc	catggatgag	gagaatgagg	atcttgcgac	ggctgctcag	300
aagataccgt	gaatctaaga	agatcgatcg	ccacatgtat	cacagcctgt	acctgaaggc	360
gaaggggaat	gtgttcaaaa	acaagcggat	tctcatggaa	cacatccaca	agctgaaggc	420
agacaaggcc	cgcaagaa					438

<210> 57  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

gaagcggctc	gcgcgcatcg	tgatgaagtg	cggaagggtc	aaagtctgtg	tcgatcccaa	60
cgaaagctcc	gacatctcca	tgccaatttc	ccgccaaaac	attaggaagc	ttgtgaaggc	120
tggtttcatt	atcaggaagc	caaccaagat	tcactctcgt	tcagagctc	gcaaaatgaa	180
gattgccaag	atgaagggtc	gtcactctgg	atacggtaag	aggaagggtc	cccgtagaagc	240
taggttgcca	acaaagggtc	tgtggatgcg	taggatgcgt	gttcttaggc	gtctgttgaa	300
gaaatacaga	gagaacgaaga	agattgacaa	gcacatgtac	catgacatgt	acatgcgtgt	360
taagggtaat	gtgttcaaga	acaagcgtgt	cttgatggag	agtatccaca	agtc aaaggc	420
ctagaagcta	ggggagaa					438

<210> 58  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

gaagaggctc	gcctctagtg	tcctccgctg	tggaagaag	aaggctctgt	tagaccccaa	60
tgagaccaat	gaaatcgcca	atgccaactc	ccgtcaggag	atccggaagc	tcataaaaga	120
tggtctgatt	atccgcaagc	ctgtgacggc	ccattcccg	gtctgatgac	ggaaaaaac	180
cttggcccg	cggaagggtc	ggcaccatgg	cataggttaag	cggaagggtc	cagccaatgc	240
ccgaatgcca	gagaagggtc	catggatgag	gagaatgagg	atcttgcgac	ggctgctcag	300
aagataccgt	gaatctaaga	agatcgatcg	ccacatgtat	cacagcctgt	acctgaaggc	360
gaaggggaat	gtgttcaaaa	acaagcggat	tctcatggaa	cacatccaca	agctgaaggc	420
agacaaggcc	cgcaagaa					438

<210> 59  
 <211> 145  
 <212> PRT  
 <213> Tobacco mosaic virus

<400> 59  
 Lys Arg Leu Ala Ala Ser Val Met Lys Cys Gly Lys Gly Lys Val Trp  
 1 5 10 15  
 Leu Asp Pro Asn Glu Ser Ser Asp Ile Ser Met Ala Asn Ser Arg Gln  
 20 25 30  
 Asn Ile Arg Lys Leu Val Lys Asp Gly Phe Ile Ile Arg Lys Pro Thr  
 35 40 45  
 Lys Ile His Ser Arg Ser Arg Ala Arg Lys Met Lys Ile Ala Lys Met  
 50 55 60  
 Lys Gly Arg His Ser Gly Tyr Gly Lys Arg Lys Gly Thr Arg Glu Ala  
 65 70 75 80  
 Arg Leu Pro Thr Lys Val Leu Trp Met Arg Arg Met Arg Val Leu Arg  
 85 90 95  
 Arg Leu Leu Lys Lys Tyr Arg Glu Thr Lys Lys Ile Asp Lys His Met  
 100 105 110  
 Tyr His Asp Met Tyr Met Arg Val Lys Gly Asn Val Phe Lys Asn Lys  
 115 120 125  
 Arg Val Leu Met Glu Ser Ile His Lys Ser Lys Ala Lys Leu Gly Glu  
 130 135 140  
 Lys  
 145

<210> 60  
 <211> 147  
 <212> PRT  
 <213> Homo sapiens

<400> 60  
 Lys Arg Leu Ala Ser Ser Val Leu Arg Cys Gly Lys Lys Lys Val Trp  
 1 5 10 15  
 Leu Asp Pro Asn Glu Thr Asn Glu Ile Ala Ala Asn Ala Asn Ser Arg  
 20 25 30  
 Gln Gln Ile Arg Lys Leu Ile Lys Asp Gly Leu Ile Ile Arg Lys Pro  
 35 40 45  
 Val Thr Val His Ser Arg Ala Arg Cys Arg Lys Asn Thr Leu Ala Arg  
 50 55 60  
 Arg Lys Gly Arg His Met Gly Ile Gly Lys Arg Lys Gly Thr Ala Asn  
 65 70 75 80  
 Ala Arg Met Pro Glu Lys Val Thr Trp Met Arg Arg Met Arg Ile Leu  
 85 90 95  
 Arg Arg Leu Leu Arg Arg Tyr Arg Glu Ser Lys Lys Ile Asp Arg His  
 100 105 110  
 Met Tyr His Ser Leu Tyr Leu Lys Val Lys Gly Asn Val Phe Lys Asn  
 115 120 125  
 Lys Arg Ile Leu Met Glu His Ile His Lys Leu Lys Ala Asp Lys Ala  
 130 135 140  
 Arg Lys Lys  
 145